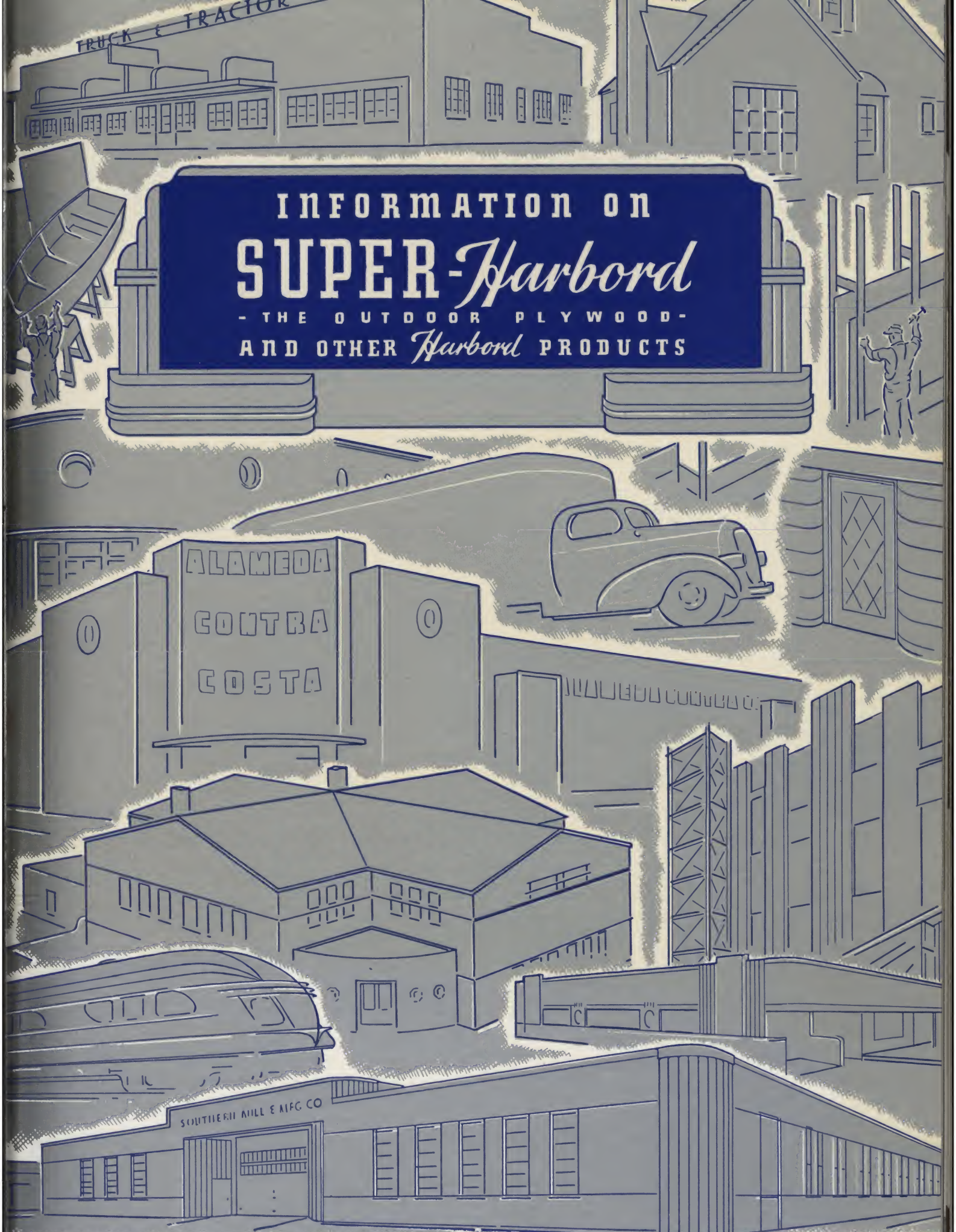
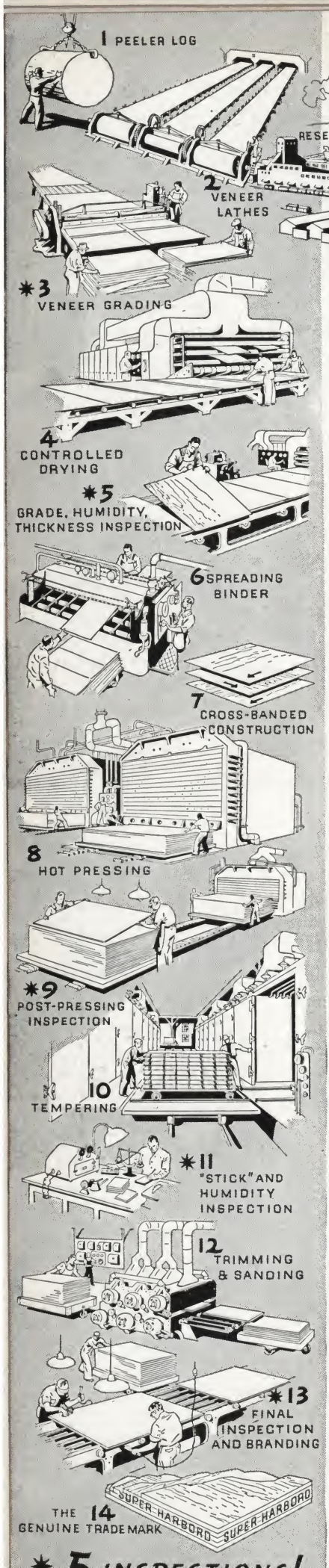


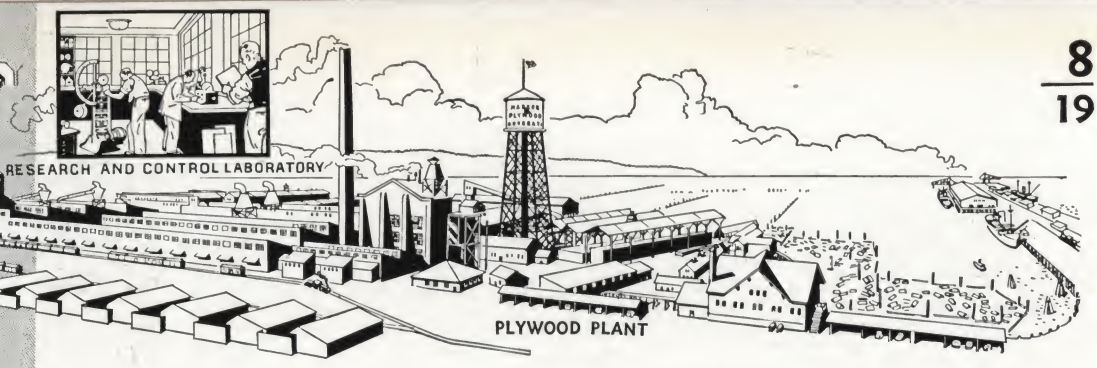
INFORMATION ON SUPER-Harbord

- THE OUTDOOR PLYWOOD -

AND OTHER *Harbord* PRODUCTS

HARBOR PLYWOOD CORPORATION • MILLS AND GENERAL OFFICES • HOQUIAM, WASHINGTON • U. S. A. •





HARBOR PLYWOOD CORPORATION

MILLS AND GENERAL OFFICES

HOQUIAM, WASHINGTON

Distributing Warehouses: Atlanta, Baltimore, Chicago, Cincinnati, Cleveland, Columbus, Indianapolis, Jacksonville, Los Angeles, Louisville, Milwaukee, New Orleans, Philadelphia, Pittsburgh, San Francisco, Toledo, Washington, D. C.

Representatives: Billings, Denver, Kansas City, Omaha, Worcester

Featured Product: SUPER-*Harbord*, The Outdoor Plywood

OTHER PRODUCTS

SUPER-*Harbord* Guaranteed WEATHERPROOF HARBOR PLYWOOD CORPORATION

Harbord Plywood Products—Harbord Plywood; Harbord Sheathing; Harbord Wallboard; Harbord Plycrete (for Concrete Forms); Harbord Industrial Plywood; Harbord Lauan Plywood (Rotary only).

SUPER-Harbord Products—SUPER-Harbord Plywood (in all grades—in panels as large as 8x16 feet); SUPER-Harbord Plycrete (for Concrete Forms); SUPER-Harbord Lauan Plywood (Ribbon or Rotary); SUPER-Harbord Redwood Plywood, HARBORSIDE.

Manufactured Products—Harbord Tennis Tables; SAG-NOTT Doors—guaranteed against sprung joints. (See diagram of cotter-keyed joint.)

This company manufactures a complete line of plywoods of ***three particular types.*** *Principal woods used are Douglas Fir, Redwood, Sugar Pine, and Lauan (Philippine Mahogany). Other western softwoods, and domestic and imported hardwoods are also manufactured into plywood and plywood products.*

The three particular types of plywood may be briefly described as (1) A plywood manufactured by an exclusive patented process using a cresylic formaldehyde synthetic resin binder, ***hot-pressed and tempered.*** *This guaranteed weatherproof plywood is the featured product, and it is trade named "SUPER-Harbord." (2) A plywood manufactured with a highly water resistant* ***casein base cold glue,*** *and intended for limited exposure to moisture. It is particularly designed for concrete form sheathing and/or lining. The trade name for this plywood is "Harbord Plycrete." It contains the same vital element of uniform precision manufacture that characterizes the line. (3) A plywood manufactured with a* ***soya bean base cold glue*** *and intended for uses where it is protected from moisture and weathering. The trade name for this plywood is "Harbord."*

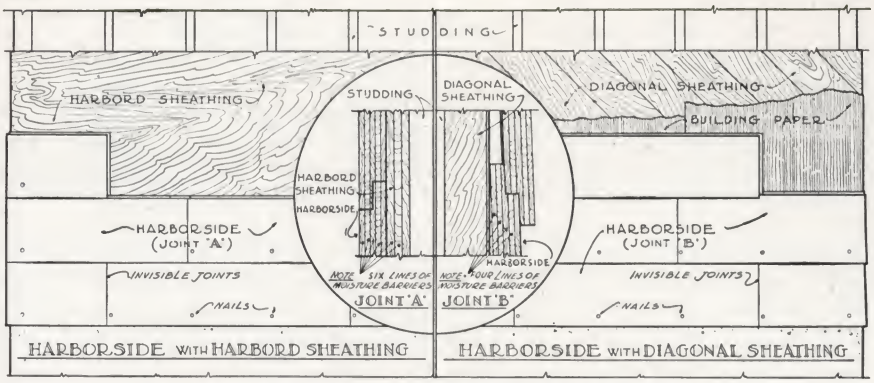
Users and the trade are ***cautioned*** *not to confuse SUPER-Harbord, the Outdoor Plywood, with Harbord. All interests are* ***warned*** *that there is no substitute for SUPER-Harbord, and domestic or foreign plywoods which may be represented as of similar type of manufacture may not be expected to render comparable service. SUPER-Harbord is edge-branded for identification, and the user will be protected by demanding the genuine.*

In addition to the SUPER-Harbord brand, it also is identified with the mark EXT-DFPA indicating that it complies with the performance specifications for exterior plywood as established by the National Bureau of Standards. ***When applied according to specifications on construction otherwise approved, SUPER-Harbord is acceptable for F.H.A. Mortgage insurance.***

SUPER-*Harbord* — PRODUCT AND BACKGROUND

SUPER-Harbord, the Outdoor Plywood, is a remarkable wood product in panel form, which, by reason of its weatherproofness, strength without useless bulk or dead weight, and other characteristics, is being widely used in construction and industry. In its pioneering of the frontiers of plywood manufacture, the Harbor Plywood Corporation developed in its own research laboratory the formulae and processes for producing a plywood that definitely is waterproof. In the strategically located plant—the largest in the world, with especially made precision machinery operated by trained plywood men under the guidance of skilled chemists and engineers—is produced the plywood with which construction men and industrial designers are breaking the shackles which heretofore have retarded progress.

SUPER-Harbord is manufactured by an exclusive patented process using a cresylic formaldehyde synthetic resin binder, hot-pressed in enormous 1,000-ton hydraulic presses (unique in design), and then tempered in closed chambers in which hygrometric equilibrium is thermally controlled above 150° F. **The binder is the vital element of SUPER-Harbord.** It is insoluble in water, withstands weathering, and is impervious to attack by bacteria and fungi; it is toxic to termites and rodents. The thermo-fusing of the plies of veneer with this binder creates a wood panel of large size with a bond between the veneers that exceeds the strength of the component parts. The uniform accuracy of the manufacture enables the engineer to compute stresses and shears without fear of failure at the bond. The product has successfully withstood years of practical service uses in locations of extreme conditions—from cycles of drenchings in tropical climates to disintegrating effects generated by the actinic rays of the desert sun, and from the subzero temperatures in refrigerating units to humid atmospheres of seed culture beds. SUPER-Harbord may be boiled indefinitely, and is unaffected by oils and petroleum products, and most common acids. The cross-banded **balanced** construction of SUPER-Harbord minimizes twisting and warping, and it will not split or crack. Expansion and contraction due to moisture or temperature changes is nil. It has all of the merits of solid wood from the standpoint of the craftsman. SUPER-Harbord is positively guaranteed against separation of plies due to moisture or any weathering condition, and may be expected to render service within the physical limits of the wood fibres of which it is made. This Outdoor Plywood has uses as yet undreamed of for application on myriads of existing and redesigned products, and in numerous features of construction not now discovered.



HARBORSIDE, the SUPER-*Harbord* Siding

Lasting protection against the extremes of the elements is assured with beautiful HARBORSIDE, the SUPER-Harbord Siding, now available in all markets. The siding is made in convenient units of 4 ft. or 8 ft. lengths, in either fir or redwood. It is double-rabbeted at sides and ends, lays up faster than other materials, and while elegant in appearance, ***the installed cost is low due to extreme labor economies.***

HARBORSIDE may be applied so as to accomplish a variety of architectural effects—for traditional or contemporary styles. Faintly discernible horizontal rustication lines are made by simple flush horizontal joints, or the horizontal edges may be eased to develop the lines. Simple or accentuated shadow lines are developed by lapping, or the use of auxiliary mouldings (HARMOULDS). HARBORSIDE may be used as vertical siding, in which case 8-ft. lengths fit most jobs without cutting.

The double lap, or rabbeted end, makes a joint practically invisible, and is superior in appearance and service to expensive hand-mitered joints heretofore used. The wood grain of the face is vertical to the length on the 4-ft. size, and parallel on the 8-ft. size. The units are packed in convenient bundles each containing minimum coverage for 100 square feet of wall area. The quantity of HARBORSIDE to be figured for a given job need not be increased to compensate for lapping. A bundle covers at least 100 square feet, and consequently a saving of from 14% to 45% may be credited. Application time is far less than on either strip siding or shingles. End joints are staggered in laying up, and no time is lost for making spliced joints or laying off courses. Ordinarily, end joints should be made over studs, and, since end joints are spaced at 4 ft. and 8 ft. intervals, they naturally fall over framing members in conventional construction. (Headers should be provided if siding is laid vertically.) Corner joints are made by mitering or square-butting to/or under corner boards and trim. 6d non-corrosive nails are recommended; there is remarkable economy in nails and nailing time.

There is only one grade of HARBORSIDE. It contains no face defects to require special painting or shellacking. All edges are treated at the mill with special resin sealer, and when ordered the faces are treated also. In accordance with recommendations of the U. S. Forest Products Laboratory, when applied the edges should be given additional treatment of thick white lead paste.

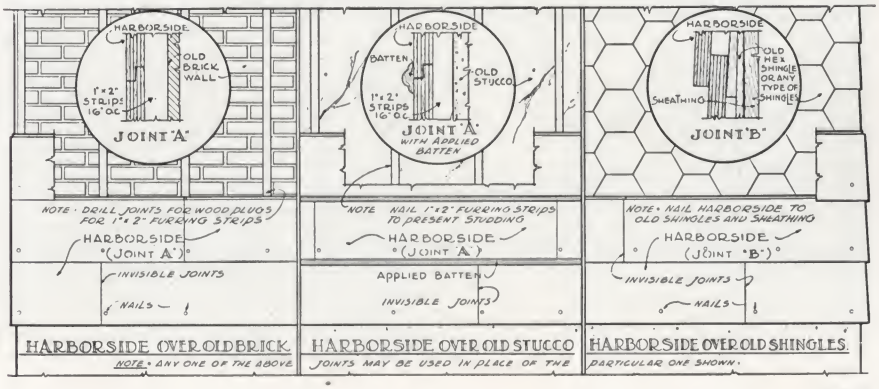
Painters may immediately follow carpenters, since the siding is delivered to the job wrapped, and is dry and ready to apply. The density and texture of the smooth surface are favorable to paint economies. The unit is $\frac{7}{16}$ in. in thickness and 5-ply—accordingly, there are four binder lines to act as moisture barriers to prevent passage of paint disintegrating-moisture to the nether surface of the paint film.

The finished cost of HARBORSIDE (in place) is definitely lower than sidings of equal quality.

HARBORSIDE IN FIR OR REDWOOD

Size	Finish and Thickness	Direction of Grain Relation to Length	No. Pieces Per Bdl.	Covering Capacity
48 x 12½	$\frac{7}{16}$ Sanded 5-ply	Vertical	24	100
48 x 15	$\frac{7}{16}$ Sanded 5-ply	Vertical	20	100
48 x 18	$\frac{7}{16}$ Sanded 5-ply	Vertical	17	102
48 x 23	$\frac{7}{16}$ Sanded 5-ply	Vertical	14	107
12½ x 96	$\frac{7}{16}$ Sanded 5-ply	Horizontal	12	100
15 x 96	$\frac{7}{16}$ Sanded 5-ply	Horizontal	10	100
18 x 96	$\frac{7}{16}$ Sanded 5-ply	Horizontal	9	108
23 x 96	$\frac{7}{16}$ Sanded 5-ply	Horizontal	7	107

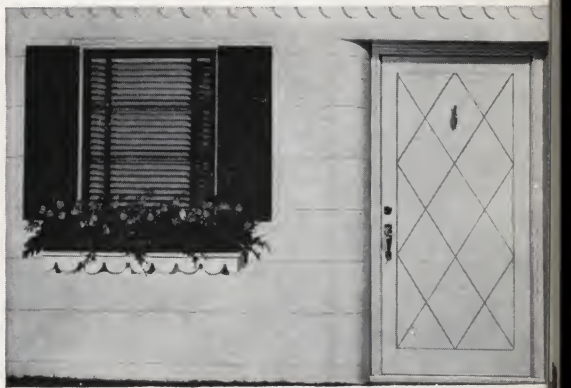
All edges are sealed with special resin sealer—optional face treatment at mill is recommended.



HARBORSIDE'S economy makes it suitable for modest homes.—Pittsburgh.

HARBORSIDE contributes beauty and permanence to this moderate cost home.—Milwaukee.

HARBORSIDE is architecturally versatile, as indicated above.—Jacksonville, Fla.



HARBORSIDE on this modern colonial has a clean sculptured appearance.—Seattle.

SUPER-*Harbord* PANELS FOR EXTERIORS

Performance Specifications—Exterior Plywood (Natl. Bureau of Standards—Par. 24-CS45-38).

"Boiling test pieces four hours and drying at 145° for twenty hours plus boiling for four hours plus testing while wet. Test pieces must show no delamination, average at least 60% wood failure, no individual test piece can show less than 30% wood failure."

SUPER-Harbord shows test results far superior to these government requirements.

SUPER-Harbord, the Outdoor Plywood, extends the range of building design, both from the standpoint of architectural features and engineering practice—the large weatherproof panels are beautiful and strong. With it the practitioner has unlimited design possibilities. The units may become the principal decorative feature (their arrangement the motif), meanwhile contributing important structural values. Function may influence form harmoniously and without sacrifice of permanence, at a cost far below an appraisal of value. It has been aptly said, "It has structural value, it has appearance value, and is not a substitute nor an imitation of anything else. It is genuine in its own right, and stems back into peoples' sentiments because it is wood." SUPER-Harbord has been accorded a spontaneous reception by construction men since its introduction several years ago, and today its use principally as siding or closure is widespread—for buildings of a variety of occupancies.

This weatherproof, guaranteed plywood is regularly available in Douglas Fir, California Redwood, and Lauan (Philippine Mahogany), in stock panels up to 5 x 12 ft. (larger on special order), and in thicknesses from ⅛ in. to 1 $\frac{5}{16}$ in. (thicker to order). Because of the exclusive binder used in making it, the panels are stronger in flexure and shear, contribute to greater paint life (by reason of integral moisture vapor barriers), are more fire resistant, and may be worked to finer detail than the cold glue types of plywood. The balanced construction with higher grade cores and crossband veneers, tight cores and absence of core voids, in conjunction with the binder, further augments its resistance to warping. It may be nailed, or screws driven near the edge without drilling. It may be worked with common hand or power tools and carpenters and woodcraftsmen work with it familiarly. The binder contains no silica; hence tool edges may be retained as with solid wood. SUPER-Harbord is a basic material for dry-built construction.

SUPER-Harbord panels applied flush on this oil station.—Des Moines.

SUPER-Harbord panels with accented lines on this service station.—Bremerton, Wash.

SUPER-Harbord panels applied with invisible joints on this series of stations.—Seattle.

SUPER-Harbord panels applied in tile-like pattern on above job.—Aberdeen, Wash.

SUPER-Harbord panel joints were covered with

These four structures and many others at the Golden Gate International Exposition are being covered with SUPER-Harbord.—San Francisco

FOR CONVENTIONAL OR PREFABRICATED CONSTRUCTION

The efficient use of SUPER-Harbord is not limited to any particular type of construction. On prefabricated construction it has demonstrated its unique qualities to the leading manufacturers, and has become standard specification. Conventional frame types are made stronger, more pleasing, and permanent, and it is easily adapted to use in conjunction with steel, other metals, plastics, and composition, because of the static nature of the exclusive binder used.

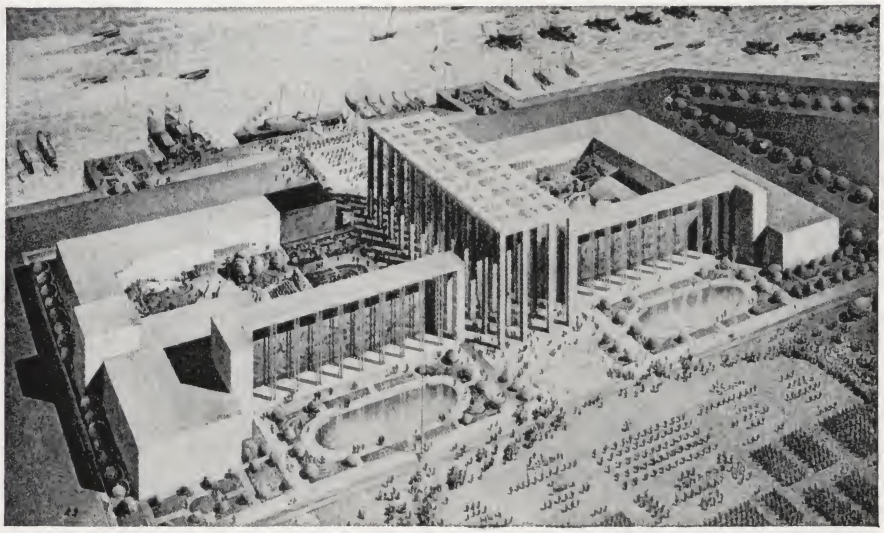
Two principal types of panel joints are used in laying up SUPER-Harbord as exterior covering: (1) A frank recognition of the joint, which, in turn, is capitalized upon for decorative details, and, (2) The successful effort to conceal the joints.

Visible Joints

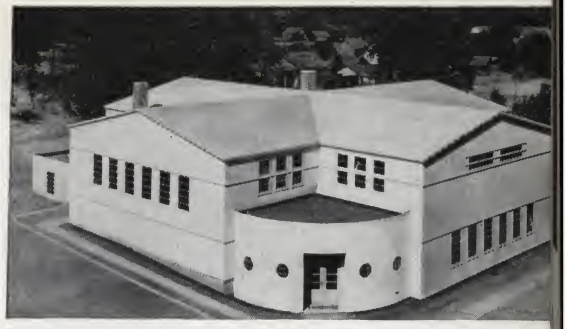
A variety of joint details are used where the lines made are intended to be evident. The lines are so arranged as to contribute to the architectural scheme. Prominent horizontal rustication lines are made by accentuating horizontal joints, or verticals are developed by emphasis on the vertical joints. Giant tile-like patterns are created by accenting both the horizontal and vertical joints. The joint emphasis is done by easing the square edges of the panels to a chamfer angle or to a near-quarter-round. Thus two edges joined form a perceptible "V". The structural joint is made by simply square-butting or some form of shiplapping—the joints to fall over framing members and be nailed thereto. The latter method is superior, and is widely used. It is usual practice to factory-machine the joint to form at least a ½ in. lap, two adjoining edges of the face worked and the opposite two adjoining edges of the back worked. The thicknesses of the SUPER-Harbord panels specified depend upon the spacing of the framing, $\frac{7}{16}$ in. being commonly used for 16 in. centers to be nailed with 6*d* non-corrosive nails directly to the framing without sheathing or backing. Thicker panels up to ¾ in. are used for wider spacings and heavier edge workings. Edges are knifed with white lead or paintable caulking. Sheathing or insulation specifications depend upon climate and other factors.

Invisible Joints

The making of invisible joints involves the use of highly water-resistant cold glues, usually of the casein type, with nails, and some form of gluestick backing or spline inserts on the face. Both types of joint are commonly successful and are hardly perceptible, particularly where decorated with a textured or flat paint. Gloss finishes are not advisable for concealing flush joints.



Above is architect's rendering of Federal Building with Colonnade of States, Golden Gate International Exposition, on which SUPER-Harbord is used extensively for covering and structural features.—San Francisco.



SUPER-Harbord was used for sidewalls and roof of this gymnasium. Other Harbord Plywoods used for making stressed covered laminated rigid bents and interior features.—White Salmon, Wash.

SUPER-Harbord is the covering material used on this factory.—Tulsa.

SUPER-Harbord covering was used on this prefabricated home. The joints are invisible.—Los Angeles.

SUPER-Harbord covering in tile-pattern on above lumber yard and office.—Aberdeen, Wash.

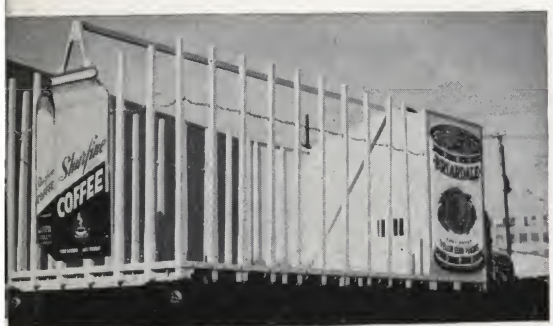
SUPER-Harbord in tile pattern as covering on this sales building.—Aberdeen, Wash.

SUPER-Harbord for signs has demonstrated its suitability on thousands of the above cut-outs, in years of service and in various climates.

SUPER-Harbord used for superstructure and cut-out figure on this unit.

SUPER-Harbord used for superstructure, cut-outs, and animated features of this sign.

SUPER-Harbord used for superstructure, cut-outs, and other features of above diorama-like outdoor unit.



SUPER-Harbord panels used for the signs on this

SUPER-*Harbord* FOR OUTDOOR SIGNS

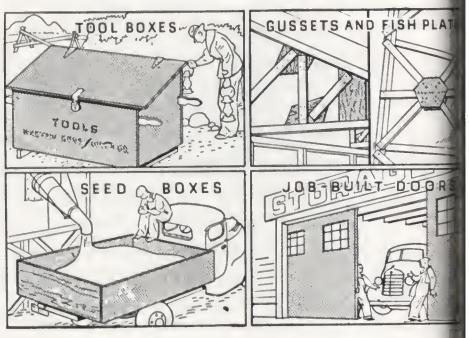
When SUPER-Harbord, the Outdoor Plywood, was made available several years ago, prominent outdoor sign users were quick to see its numerous advantages—to capitalize upon its unique characteristics. Thousands of cut-out signs of the type illustrated at the top left of this page were put into service, and in extremes of climatic conditions. They were installed in locations varying from the desert to the seashore, and from subzero to semi-tropical conditions. These signs today, after years of exposure, still render excellent sales service. Paint life on SUPER-Harbord with these and other units has been demonstrated with remarkable performance. More recently many of the leading outdoor plants have adopted SUPER-Harbord as regular specifications, and for such features of road signs as superstructure, columns, over-panels, cut-out skyline readers, appliques, animated silhouettes, etc. On painted bulletins it is also used for the primary panels with complete success. (Primary panels may be fixed into place with common nails, routings, or channels, or with screws or double-headed nails.) It is obvious, after a consideration of the physical qualities of SUPER-Harbord, that its use for signs has many advantages.

SUPER-Harbord is a wood product easily shaped and fabricated by regular shop labor with common tools; expensive machine equipment and high scale out-of-shop specialty work is not necessary. The giant panels are light in weight, strong, flat, and smooth, but with ample "tooth," and sign paint made especially for application on wood covers quickly and with lasting and beautiful results.

Reflection may be controlled remarkably. The binder lines between the veneers act as moisture barriers to minimize the passage of paint disintegrating-moisture to the under side of the paint film. The **balanced** cross-banded construction stabilizes the panels, and hence warping is minimized.

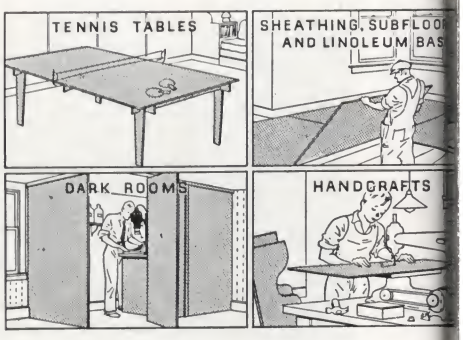
Readers, silhouettes, and appliques are easily shaped with scroll-, jig-, or band-saw. Free-standing three-dimension letters are made from the thicker stock without reinforcing, or if thinner material is required, it is braced with scraps of the Outdoor Plywood, with solid wood or metal channel.

In service the signs are not seriously dented by missiles, and scars may be easily painted over. Rolling and stretching in making reclaims is eliminated. SUPER-Harbord quickly demonstrates economy in initial and service costs, and its appreciation by the sign profession is increasing rapidly. (See page No. 11 for grades and sizes.)



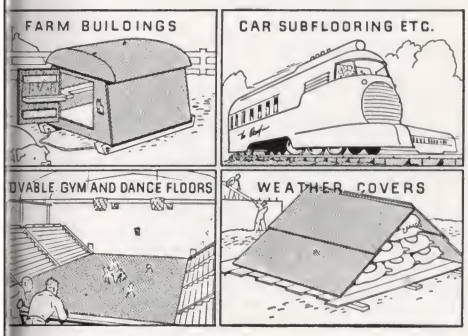
MANY

Space will not permit even cataloging of the multi-various uses of SUPER-Harbord in industry. Construction men appreciated it first, and from their use has spread the recognition of its values for numerous purposes. It has become regular features of incubators, re-



HARBORD

Harbord Plywood **(a soya bean base cold glue type available in all grades),** in the nearly fifteen years that it has been on the market, has come to be the standard for uniformity and high quality. It has established an enviable reputation because of its experienced and careful manufacture with precision machinery, operated by skilled craftsmen from selected materials; then it is carefully



USES

frigerator units, seed culture beds, specialized shipping containers, etc., and is used for wagon and wheelbarrow boxes, drying pallets, developing trays, cutting boards, toys, pickling vats, etc.—a great variety of articles that require SUPER-Harbord's unique characteristics.

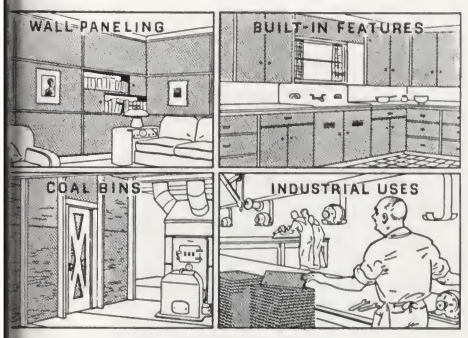
SUPER-*Harbord* FOR BOATS

Boat builders have long sought a material in panel form which may be used for permanent surfaces, and with qualities peculiarly suited to boat craftsmen. Now such a material is stocked in most domestic markets, or is available on short notice from distributors, and its dependability has been demonstrated on thousands of boats over several years of regular service. All over the country boat manufacturers, professional and amateur boat builders, and water-sports equipment makers are using SUPER-Harbord, the Outdoor Plywood. They use it for bottoms and sides, planking, decking, bulkheads, paneling, superstructure, etc. on various types of boats. It also fits the needs for surf boards and similar articles.

The waterproof characteristics of this unique plywood, together with the ease of shaping large units of it, suit it exactly to boat requirements.

Stock panels of SUPER-Harbord up to 5 x 12 ft. and in thicknesses from ⅛ in. to $1\frac{3}{16}$ in. are generally available, and larger and/or thicker sizes may be had to special order. The stock sizes fit the demands of small boats and features of larger ones. The grade suitable for boat work is known as Good 2 Sides, although the Good 1 Side grade may be used when only one side is to be exposed. Curvatures may be put into the panels to a limited extent while dry, but where necessary the panels may be steamed or soaked for bending to smaller arcs.

Marine screws, nails, and other non-corrosive hardware are used in conjunction with SUPER-Harbord. In fitting pieces of the plywood, it is best practice to carefully coat all edges and backs with marine lead or other caulking mastic and coatings. The exposed faces may be finished with marine paint or best spar varnish. (This protection is recommended as a preservative of the wood, and to assure long life, for while there is no hazard of delamination at the glue line, the wood fibres of the veneers have certain physical limits characteristics of the specie.)



PLYWOOD

graded and handled for shipment. Its use is recommended for construction features and other applications where it is protected from moisture and weathering. The greatest volume is used in the utility grades. Its strength and workability in all respects exceed that of panel boards not made of wood. Special literature devoted to this type of plywood and its uses is available.

A dramatic demonstration of SUPER-Harbord's ruggedness was made by the Nevills 1938 Colorado River Expedition. (See photo at top-right.) The three cataract-type boats used by the Expedition were constructed almost entirely of SUPER-Harboard. After the party had negotiated the 666 miles of the worst "white water" in the world, and subjected their boats to gruelling shocks and severe distorting stresses in the rapids, on lining jobs, and in making portage, Mr. Norman D. Nevills wrote: "There is not one leak or break in any of the three boats. . . . The boats were given thousands of tests — the surplus strength without useless bulk or dead weight of your SUPER-Harbord was demonstrated. Indeed, SUPER-Harbord is the ideal boat material, and has the stamina to 'take it'."

SUPER-Harbord was used as bottoms, sides, decks, bulkheads, seats, cowling, air chambers, etc. of three cataract type boats used by Nevills 1938 Colorado River Expedition.

SUPER-Harbord in fir and lauan were used as sides, deck, etc. on this stock model outboard motor type.

SUPER-Harbord is used by leading boat manufacturers. Thousands of SUPER-Harbord boats are rendering satisfactory service.

SUPER-Harbord is used by custom boat builders for principal features. The speed model at right exemplifies fine craftsmanship.

SUPER-Harbord is ideal material for amateur boat builders. The boy below proudly exhibits his SUPER-Harbord boat.

SUPER-Harbord contributes strength, appearance, and long service life to truck bodies.

SUPER-Harbord is used for subfloors, wall strengthening, decking, etc. by leading body builders.

SUPER-Harbord is widely used for better trailer bodies. This model is in natural SUPER-Harbord lauan, varnished.

SUPER-Harbord, because of its strength without useless bulk or dead weight, is widely used as railroad car lining and other features. Above is new type refrigerator car with SUPER-Harbord exterior and

8
19

SUPER-*Harbord* FOR TRUCK BODIES, TRAILERS, RAILROAD CARS

Strength Without Useless Bulk or Dead Weight

The extraordinary strength and absolute weatherproofness of SUPER-Harbord, coupled with its light weight, accounts for its general acceptance by informed builders of truck bodies, buses, house and cargo trailers, and railroad cars. The important shops serving the trade in their respective lines, after exhaustive tests and road service demonstrations, have made the guaranteed plywood standard specification. Leading custom builders have adopted SUPER-Harbord, and for a variety of transport types. Its fabrication and service characteristics have long since been adequately proven, and now the material with a performance record is available to all.

SUPER-Harbord is used for sides, decks, lining, and bulkheads, and while it is generally painted, varnished, or covered with fabric or other decorative material, its ruggedness and resistance to the disintegrating effects of moisture vapor and weather may be relied upon. Body builders and car-wrights have in this unique plywood a material which is worked and finished with common hand or power tools, and decorated with lasting beautiful results. SUPER-Harbord is fixed into place with glues, screws, bolts, rivets, and nails. It so strengthens the framework to which it is applied that its structural value often exceeds other considerations. Its rigidity and resistance to puncture is remarkable. Tolerance for expansion and contraction due to humidity or temperature changes is nil due to the cross-banded construction. The large panels, when applied, have a minimum lineal footage of joints which may be caulked to stop air or dust infiltration. Curved and flush features are designed for construction with this plywood with the assurance of its suitability. It has definite thermal insulation value, and this factor, together with its waterproofness, dictates its use particularly where temperature control is important—in refrigerator cars and trucks it has proven its worth. On passenger buses and the new streamlined railroad cars the industrial grades and sizes of SUPER-Harbord are used for subfloors, backing, and other structural features because of its strength, light weight, sound absorption qualities, and other characteristics. The panels made of lauan or other finish woods are used for interior decoration and service features.

SUPER-Harbord in fir, redwood, and lauan (Philippine Mahogany), of various sizes and grades, may be specified, depending upon the degree of strength and decorative value desired.

Noteworthy advances have quite recently been made in railroad refrigerator car design incorporating major specifications of SUPER-Harbord. This new type now in service utilizes the Outdoor Plywood for exterior covering (car siding), floors, lining, ice compartment bulkheads, and other important features. This recognition by the foremost car engineers of the numerous benefits of SUPER-Harbord presages economies not obtainable with any other material. Precedence and cost records were broken at once. Streamlined strength (SUPER-Harbord) replaces needless bulk and dead weight.

SUPER-Harbord is necessary specification for this dairy barn where humidity is high.

SUPER-Harbord FILLS VARIOUS NEEDS

Construction Closures

Temporary store fronts are often called upon to do service through periods of extremely wet weather or for an uncommon length of time. Where time or rains are anticipated, only SUPER-Harbord, the Outdoor Plywood, should be used. Plywood has many natural advantages for such work, including ease and speed of constructing into place, and decorating so as to contribute institutional good will and advertising value for the contractor and tenant. It has remarkable strength, and accordingly the safety factor of such closures is increased. When built of SUPER-Harbord, the structure may be left in place indefinitely, if necessary, and completely salvaged for re-use.

SUPER-Harbord is economical for job closures because of its weather resistance.

Store Fixtures

SUPER-Harbord has qualities in a class apart for cabinet making, particularly where the finished work is to be subjected to moisture or conditions that develop condensation. For flower, vegetable, fish, and wet goods display fixtures, counters, cooler rooms, humidity chambers and ducts, window backs, partitions, cutting tables, etc., the waterproof nature of the exclusive binder insures permanent service without hazard of glue line failure.

SUPER-Harbord is required for display fixtures for damp merchandise, such as the flower shop above.

Display Pieces

Display artisans cannot hazard a possible failure of the material of which their pieces are constructed, and they were quick, therefore, to recognize the worth of SUPER-Harbord. They appreciate it because of several unique qualities not found in any other material. The balanced cross-banded construction of this plywood assures uniform performance. It may be worked to fine detail, and nails or screws driven near the edges. Band saws and other cutting tools are not dulled, for silica or other abrasive substances are not used in making it. It may be steamed or wetted for bending, where necessary, and for sets in which the material is to subjected to moisture or weathering there is no substitute. It may be used in conjunction with all other display materials, including metals, plastics, fabrics, papers, paints, etc., and has remarkable structural strength for animated or spectaculars, and pieces involving public or property liability.

SUPER-Harbord is preferred for display pieces.

Unusual Interiors

For the lining of freezing rooms of refrigerating plants is one example of SUPER-Harbord's adaptability to the unusual. In such installations uncommon stresses are encountered, and in periods of shutdowns, moisture condensation occurs in places where most materials are vulnerable. Refrigerating engineers have available in this guaranteed plywood a material with the stamina to withstand conditions with which it may be subjected.

Another example of SUPER-Harbord's adaptability is its use as walls and ceilings of dairy and stock buildings. Such installations are subjected to periods of drying and humidity, and ordinary plywood should not be called upon to render long service. Humidity conditions in dairy buildings often cause serious misalignment of framing, and accordingly unusual precautions should be taken with the application of panels, and provision made for framework "movement." Only SUPER-Harbord, the Outdoor Plywood, should be used.

Other examples of the fitness of SUPER-Harbord for peculiar conditions are those encountered in tobacco sweating rooms, rehumidifying rooms, fruit dehydrating apparatus, etc.

SUPER-Harbord is used for covering and lining of dry kilns.

Convincing demonstrations of SUPER-Harbord's serviceability under extreme conditions are its uses in the construction of lumber dry kilns. A number of such kilns that are lined and covered with it have been rendering highly efficient service—kilns in which occur alternate cycles of humidity as high as 85%, and temperature to 200° F. to extremely low humidity and temperature below freezing. The guaranteed plywood's perfect performance record on "tough" jobs is convincing, indeed!

SUPER-Harbord for outdoor displays stands weathering.

PLYCRETE* (CONCRETE FORM PANELS)

*"Plycrete" is the generic trade name of the concrete form panel plywood manufactured by the Harbor Plywood Corp., available in two types: (1) SUPER-Harbord Plycrete, which is hot-pressed with an exclusive cresylic formaldehyde synthetic resin binder and tempered. (2) Harbord Plycrete, which is cold-pressed with a casein base type of cold glue.

Concrete form plywood carrying the Plycrete grade mark has the highest uniform performance record of any form material made. It has demonstrated its ruggedness on large and small jobs the nation over, and in many foreign countries. This use of the product is specialized upon by its manufacturers. The brand Plycrete is recognized by experienced engineers as a mark of known and predeterminable behavior. Panels are available in a choice of two types and values, each designed for specific service performance.

SUPER-*Harbord* Plycrete

The ultimate of form panel service may be expected of SUPER-Harbord Plycrete. The binder used in its manufacture is unapproached by any other made. It is insoluble even in boiling water, most common acids or alkali reaction developed in concrete setting. It holds the specially selected veneers in their cross-banded position permanently, and the panels made with it may be re-used to complete physical destruction without hazard of failure at the binder line. The extra thickness of the choice face veneers bonded with this exclusive binder assures maximum service use until the panels have been completely destroyed by abrasion, abuse, or cut up into uneconomic units. Extra smooth faces characterize the face veneers. There is no alternate for SUPER-Harbord Plycrete where freight, handling, or fabrication costs are high, where climatic humidity is excessive, or where maximum re-use is required. On standardized multi-use or interchangeable form units it is almost universally used. The panels are edge-branded "SUPER-Harbord Plycrete."

Harbord Plycrete

U. S. Commercial standards (CS45-36 and the revision for '38) designate a special grade of concrete form plywood to be manufactured with a highly water resistant cold glue; certain veneer specifications are included. Harbord Plycrete meets such specifications, and is competitive in price to all panels of the grade and class; yet the same integrity and responsibility, careful choice of materials and precision manufacture that characterize the complete Harbord line are "ingredients" of this grade-marked, trade-marked type. Harbord Plycrete may be expected to render limited re-use service. It is a "closed" specification by engineers who calculate the cost-per-square-foot-of form-service on jobs where the panels are to be amortized on one project.

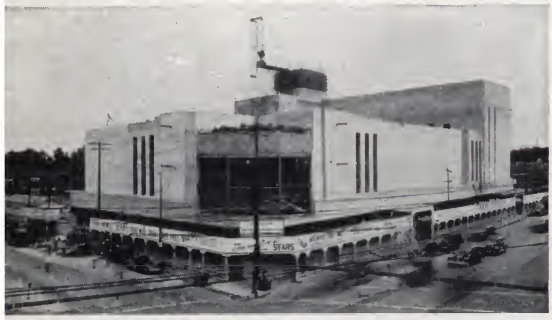
Briefly: Concrete form plywood should be specified by trade name as follows: (1) For maximum re-use as sheathing and/or lining—SUPER-Harbord Plycrete. Fifteen or more re-uses are common service. (2) For limited re-use as sheathing and/or lining—Harbord Plycrete. Eight or more reuses are common. Salvage may be expected on both types beyond that for ordinary form materials.

Plycrete panels are edge sealed with resin-aluminum sealer with a distinctive silver blue tint, to seal end grain and assure greater re-use. Factory treating with special form oil or other material at buyer's option.

Above shows construction progress of job making typical re-use of Plycrete.

Plycrete is required for fine architectural concrete.

Plycrete renders repeat re-use on large and small work.



Plycrete is regular specification of informed contractors.

Plycrete is used on important structural and architectural concrete projects the world over.

TABLE OF SUPER-Harbord STANDARD SIZES

Item	Widths	Lengths	Thicknesses
Stock Panels	From 12", increasing by 2-in. units to 30"; also 36", 42", 48" and 60"	48", 60", 72", 84", 96", 108", 120" and 144"	1/8" (3-ply sanded 2 sides) increasing by 1/16" thicknesses to 1 3/16" (9-ply)

Heavier thicknesses, wider widths, and longer lengths to order. Information on request. (See U. S. Commercial Standards CS45-38.)

Physical appearance of SUPER-Harbord is similar to that of regular Douglas Fir plywood grades—same appearance grading rules are used, except as applies to automobile and industrial stock. (See U. S. Commercial Standards CS45-36 and revisions now being made to be published as CS45-38).

EXPANSION AND BUCKLING TESTS ON SUPER-Harbord

Expansion

Relative Humidity		
25%	. . . . .	starting
60%	. . . . .	0.06%
90%	. . . . .	0.12%
100%	. . . . .	0.15%

Buckling Characteristics

Measurements taken on 40x48 in. specimens rigidly attached to steel framing subjected to a 97% relative humidity at 90° F. for a period of two weeks. 1½", 5 ply specimens. Results: The maximum rise of surface = 0.06 in.

GRADES According to National Bureau of Standards CS45-38

Good Two Sides (G-2-S)—This grade is intended for natural or light stain finishes. Both faces are clear and 100% heartwood of a yellow or pinkish color.

Good One Side (G-1-S)—One face is the same as that described under Good Two Sides grade, while the opposite face is the same as the Sound Two Sides grade described below.

Sound Two Sides (SO-2-S)—This grade presents a smooth, sound surface on both sides suitable for painting. The faces may be of one or more pieces of firm, smoothly cut veneer. If of more than one piece, they will be well-joined and reasonably matched for grain and color at the joints. Sap and natural discoloration are considered no defect.

Wallboard (W-B)—The face side is the same as described under Sound Two Sides. The opposite side contains defects in number and size that will not affect the strength or serviceability of the panel.

Sheathing (SH)—This is unsanded and made only in following sizes: thicknesses 5/16" and 3/8", 3-ply; 5/8" 3 or 5-ply; Widths 32" and 48"; Length 96". One face shall present a solid surface except that it permits of small knot holes and thin splits. Sheathing panels are scored or marked for nailing.

Concrete Form Material—(Made in standard panel dimensions with special highly water-resistant glue). 5/8-in. thickness is recommended for most form jobs, but ½-in., 9/16-in., 11/16-in. and ¾-in. panels are stocked in standard panel widths and lengths. Both faces are carefully selected and sanded so that concrete surfaces will be smooth and true, thus eliminating costly rubbing labor. When specified, panels will be mill-treated with special water-repellent oil at nominal cost. Panels ¼-in. thick are available as form liners and for curved surfaces.

Automobile and Industrial Stock—(Rough). In ½-in. to 7/8-in. thicknesses. Faces are free from knot-holes, but tight knots are admitted.

Explanation

Substituting S01S for Wallboard grade in all stock thicknesses. Industrial grade is same as S02S.

MODULUS OF ELASTICITY DATA ON SUPER-Harbord

Procedure for Modulus of Elasticity Tests

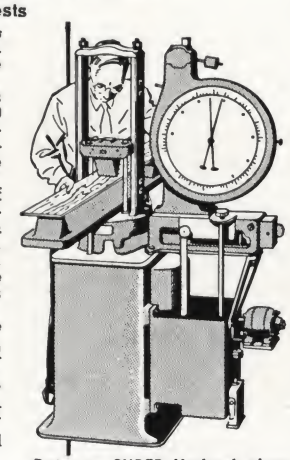
Selection of Samples—Eighty samples of each construction of plywood to be tested were cut 4x20 in. Forty samples had the face grain running the length of the test piece, and 40 samples had the face grain running the width of the test piece.

Treatment of Samples—No sealer or oil treatment of any kind was used to retard the moisture absorption of the plywood. Of each 40 samples, 10 were tested in the condition they came from the warehouse, 10 were tested after 24 hours soaking in water at room temperature (70° F.), 10 were tested after 48 hours soaking and 10 were tested after 72 hours soaking.

Tests—The modulus of elasticity was figured from the deflection of the plywood used as a simple beam having free ends and a concentrated load at the center of the span. All 3-ply plywood was tested on a 10-in. span and 5 and 7-ply plywood was tested on a 16-in. span. All tested pieces were measured for thickness to the nearest .001 in. Deflection data was taken for four loadings on each sample and the maximum load did not exceed one-half of the ultimate load. Deflections were measured to the .001 in.

Calculations—The modulus of elasticity was calculated from the formula: $E = \frac{Wl^3}{fI48}$ where f equals the deflection of W pounds and I equals $\frac{bd^3}{12}$ where d is the entire thickness of the test sample. The modulus of rupture was calculated from the formula: $s = \frac{Mc}{I}$ and I equals $\frac{bd^3}{12}$ where d is the entire thickness of the test sample and $M = \frac{Wl}{4}$ where W is the ultimate load.

Note: It will be noted in some cases that the moduli of elasticity were slightly higher than the preceding test when they should have been slightly lower. This is due to different percentages of end grain in the face ply and the fact that wood is not a homogenous material.



Data on SUPER-Harbord given here is result of actual tests made in Company's laboratory. Data given in this comparison is for dry panels in all instances.

Table A shows a comparison of the modulus of elasticity for different thicknesses of regular concrete form panels as compared with the same thickness of SUPER-Harbord. The values for regular concrete form panels are computed from data supplied by the Douglas Fir Plywood Assn.

Results of Modulus of Elasticity Tests on SUPER-Harbord

Table A Thickness	Modulus Elasticity for Regular Concrete Form Panels	Modulus Elasticity for SUPER-Harbord
¼ in.	1,412,000	2,405,000
½ in.	1,152,000	1,503,300
¾ in.	947,000	1,240,400

¼ IN. SUPER-Harbord—Construction 3-ply

Treatment	Direction of Face Grain	Moisture Content	Modulus of Elasticity	Modulus of Rupture
A	‖	7.1%	2,405,000	15,200
B	‖	32.8%	1,719,500	9,090
C	‖	39.8%	1,959,300	8,240
D	‖	48.5%	1,409,300	8,340
A	⊥	10.4%	210,860	3,870
B	⊥	29.7%	226,450	3,920
C	⊥	43.0%	225,450	3,130
D	⊥	45.9%	188,430	2,880

½ IN. SUPER-Harbord—Construction 5-ply

Treatment	Direction of Face Grain	Moisture Content	Modulus of Elasticity	Modulus of Rupture
A	‖	7.6%	1,503,300	8,610
B	‖	30.9%	1,215,000	6,660
C	‖	35.1%	1,155,000	7,092
D	‖	37.4%	1,160,000	6,320
A	⊥	8.2%	721,500	6,840
B	⊥	25.0%	623,200	5,920
C	⊥	35.5%	601,600	4,970
D	⊥	37.4%	626,200	4,760

¾ IN. SUPER-Harbord—Construction 7-ply

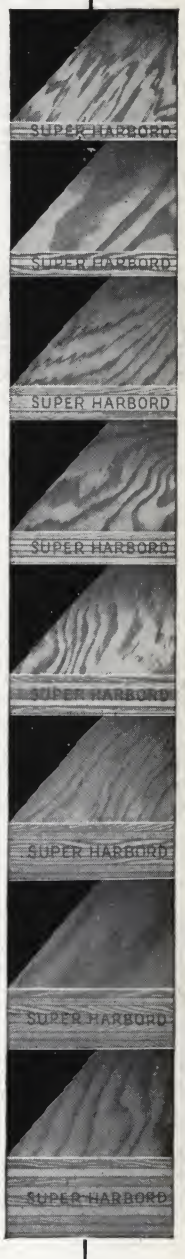
Treatment	Direction of Face Grain	Moisture Content	Modulus of Elasticity	Modulus of Rupture
A	‖	8.3%	1,240,400	8,580
B	‖	24.8%	962,300	6,510
C	‖	30.7%	979,700	6,060
D	‖	34.7%	944,500	5,520
A	⊥	8.1%	599,650	5,840
B	⊥	26.7%	563,500	6,140
C	⊥	30.7%	494,200	5,120
D	⊥	33.7%	482,800	5,070

Note: In design of concrete forms, stresses given for 72-hour soaking period should be used.

Legend: ‖—Parallel to span. ⊥—Perpendicular to span. A—Dry. B—24 hrs. soaking. C—48 hrs. soaking. D—72 hrs. soaking.

Special informative bulletins are available from the Company on various uses of their products. A fully staffed Department of Research and Engineering is maintained at the General Office for unusual problems. The Company is a member of the Douglas Fir Plywood Association, Fir Door Institute, and other trade organizations.

Representative Plies and Thicknesses of SUPER-HARBORD



3-ply—5/16 in.
Used largely for bending, light industrial work, trailers, toys, cut-outs, display, boat features, etc. Stocked in fir, redwood, and lauan, in panels up to 4x8 ft., larger on special order.

3-ply—¼ in.
A popular thickness, used for great variety of work. May be bent for curved linings, fixtures, etc. Stocked in fir, redwood, and lauan, in panels up to 5x12 ft., larger on special order.

3-ply—⅜ in.
(5-ply mill option)
A popular thickness, used for signs, truck bodies, boats, exterior paneling, and features of buildings; for heavy curved linings, etc.

5-ply—½ in.
A popular thickness, used for signs, truck bodies, boats, trailers, exterior paneling and siding, variety of industrial uses, etc. Stocked in fir, redwood, and lauan, in panels up to 5x12 ft., larger on special order.

5-ply—⅝ in.
A popular thickness, used for signs, truck bodies, boats, trailers, exterior paneling and siding; for form sheathing, a variety of industrials, etc. Stocked in fir, redwood, and lauan.

5-ply—¾ in.
(7-ply mill option)
A popular thickness, used for signs, truck bodies, bulkheads, exterior paneling and siding; for form sheathing, motor mountings, and other industrials; for cold room closures, etc. Stocked in fir, redwood, and lauan.

7-ply—⅞ in.
(9-ply mill option)
A thickness used for cut-out signs, truck and trailer flooring, industrial reinforcing, etc. Available in fir, redwood, and lauan, in panels up to 5x12 ft., larger on special order.

9-ply—1 3/16 in.
(11-ply mill option)
An industrial item, also used for cut-out letters, boat transoms, car bulkheads, etc. Available in fir, redwood, and lauan, in panels up to 5x12 ft., larger on special order.

Representatives of this Company are prepared to render valuable counsel on concrete form projects. A Research and Engineering staff is available at the General Office. Special informative bulletins are available upon request.

See National Bureau of Standards (CS45-38) performance recommendations for exterior plywood. The specifications are regarded as **minimum** performance for SUPER-Harbord.

MEMBER · DOUGLAS FIR PLYWOOD ASSOCIATION · dfpa

SUPER-Harbord

THE OUTDOOR PLYWOOD

NO WEATHER MADE CAN HARM THIS PLYWOOD

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Mills and Gen

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phia, Pittsburgh

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